

REMARKS

Claims 1-20 are pending in this application. Claims 2-5, 7, and 11-20 are allowed over the prior art of record. Claims 1, 6, and 8-10 stand rejected, and are at issue herein.

The Applicant wishes to thank the Examiner for consideration and examination of the claims of this application. The Applicant acknowledges the Examiner's indication of the allowability of claims 2-5, 7, and 11-20 over the prior art of record. However, the Applicant respectfully traverses the Examiner's statement in paragraph 3.1 of the Official Action to the extent that it differs from a mere restatement of the claim language. The Applicant further respectfully traverses the Examiner's statement and reasoning insofar as they would lead to or suggest, if at all, an interpretation of the claimed invention different from the full extent of claim scope afforded thereto by the established law and in the absence of the statement in paragraph 3.1.

The Examiner has rejected claims 1, 6, and 8-10 under 35 U.S.C. § 102(a) as being anticipated by Denker (U.S. Patent No. 5,958,053). The Applicant wishes to maintain his traversal of this ground of rejection stated in the previous response, but has made a clarifying amendment to independent claim 1 that should make clear the inherent distinction argued previously that allocation of a small TCB requires allocation of memory resources. Reconsideration of this ground of rejection and indication of the allowance of claims 1, 6, and 8-10 at an early date in view of the foregoing amendment and the following remarks are respectfully solicited.

Independent claim 1 as amended, from which each of the rejected claims depend, requires *inter alia* "allocating a small TCP control block (TCB) in memory to service a TCP/IP three-way handshake." As is well-known in the art and as is specifically recognized in the Denker '053 reference, the allocation of a TCB utilizes memory resources. Indeed, Denker '053 states that a server typically allocates "in memory" a full blown transmission control block after receiving a SYN message to store all the required information for the connection with the expectation that the incipient connection will soon become a fully established connection." Denker '053, column 2, lines 60-67. However, Denker '053 also recognizes that other resources are allocated for an incipient connection, to wit computation and communication resources. As such, Denker '053 states that "it is desirable to find a defense where the server commits only proportional amounts of resources [as the attacking client], namely modest computation, modest

communication, and, if at all possible, zero memory." Denker '053, col. 3, ln. 18-25 (emphasis added).

The Examiner has cited to col. 4, ln. 48-52 for the proposition that Denker '053 allocates a small TCB as required by claim 1. However, this cited section actually refers to the allocation of "minimal resources" in response to the receipt of a SYN packet. As will be discussed in detail below, the Applicant respectfully submits that these "minimal resources" actually refer to the "modest computation, modest communication, and, if at all possible, zero memory" discussed as a desire of the invention. Since claim 1 now explicitly recites that the allocation of the small TCB is "in memory," the Applicant respectfully submits that this claim and those dependent thereon cannot be anticipated by the system of Denker '053.

While independent claim 1 requires the allocation of a small TCB in memory to service the TCP/IP three-way handshake, the protocols of Denker '053 specifically require that no memory resources be allocated for the incipient connection. Specifically, Denker '053, column 7, lines 31-36 specifies "after receiving the SYN message of step 1020C, server 110 performs only the minimal communication and computation, and allocates no memory resources for the incipient connection." (emphasis added). Denker '053 continues in column 9, lines 37-42, "as compared to TCP, TCP2B provides an improved defense against SYN flooding because server 100 (under TCP2B) does not allocate any memory resources for the connection until server 110 determines that the message of step 3040C passes the appropriate mathematical (i.e., cryptologic) test." (emphasis added). As is clear from these quoted sections from Denker '053, the TCP2B protocol described in this reference specifically requires that no memory resources be allocated until after the connection is validated contrary to the requirement of claim 1.

Denker '053 also describes a second protocol, TCP2E, that utilizes a Friends Table to determine whether or not a connection request should be completed. However, in this second protocol, Denker '053 also requires that no memory resources be allocated until the connection is determined to be valid. Specifically, Denker, column 12, lines 29-34, states "at step 215 of FIG. 7 (after server 110 determines that the client's address is not on the server's Friends Table), server 110 performs only the minimal communication and computation, and allocates no memory resources for the requested connection." (emphasis added). Denker '053 continues at lines 52-57 "at this point server 110 need not allocate memory to store its acknowledgement number \$c\$, client 105's IP address or port, client 105's initial sequence number (400 in step 1020E of FIG. 6), client 105's window size, client 105's requested options, or other information regarding the requested connection." (emphasis added). In summary, Denker '053 states in column 15, lines

23-27 "the TCP2E protocol offers a greatly improved defense to a SYN flood attack as compared to TCP because a transmission control block will not be allocated upon receipt of a SYN message unless the client's address is on the server's Friends Table."

In addition to these two first-level protocols, Denker '053 also describes a second-level protocol that operates to determine which of the two first-level protocols should be used. However, this second-level protocol operates under standard TCP until it determines that the server is under an SYN flood attack. Specifically, Denker '053 explains, beginning in column 15, line 66 and continuing to column 16, line 5 "If at step 310 of FIG. 8, server 110 determines that it is not under attack (i.e., the above described ratio is not below the threshold), then server 110 implements standard TCP, with no defense measures. In other words, server 110 can allocate computational resources, communication resources, and a full transmission control block in response to receiving each request for a TCP connection (SYN message)." This operation is clearly contrary to the system and method of the present invention, and in fact allows the server to come under a SYN flood attack until a certain threshold is exceeded. Once the threshold is exceeded, the second-level protocol operates to determine whether TCP2B or TCP2E should be implemented. However, as described above, each of these two first-level protocols requires that no memory resources be allocated until the connection request is verified. As such, the Applicant respectfully submits that Denker '053 cannot anticipate independent claim 1 which requires the step of allocating a small TCP control block (TCB) to service a TCP/IP three-way handshake. Reconsideration of this ground of rejection of independent claim 1, and dependent claims 6 and 8-10 are therefore respectfully solicited.

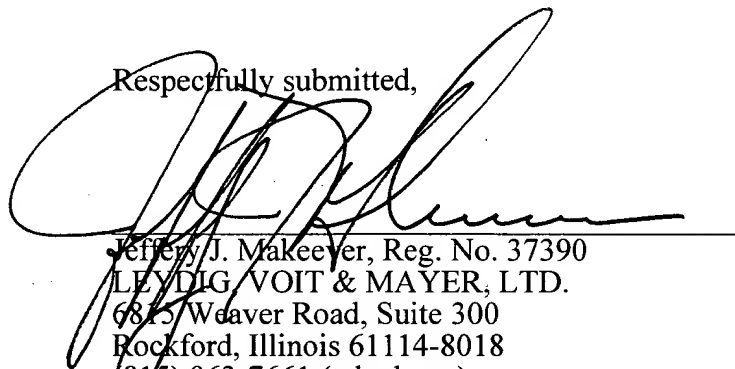
As the foregoing and an analysis of Denker '053 make clear, the "minimal resources" that are allocated in response to a SYN message cannot include any "memory resources." This is directly supported by Denker '053 statement in col. 3, ln. 18-25 that the "resources" allocated in response to a SYN message should be proportional to the resources invested by the attacking client, "namely modest computational, modest communication, and, if at all possible, zero memory." As the quoted portions of the Detailed Description discussed above illustrate, the system of Denker '053 has made it possible to allocate "zero memory". Since the small TCB is allocated in memory as claimed by claim 1, Denker '053 cannot anticipate this claim, or those dependent thereon, as they do require the allocation of memory resources for the small TCB.

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In view of the above the Applicant respectfully submits that claims 1-20 are in condition for allowance, claims 2-5, 7, and 11-20 having previously been indicated as being allowable over the prior art of record. Reconsideration of this application and indication of the allowability of claims 1-20 at an early date are respectfully solicited.

If the Examiner believes that a telephonic conversation will aid in the resolution of any issues not resolved herein, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,



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